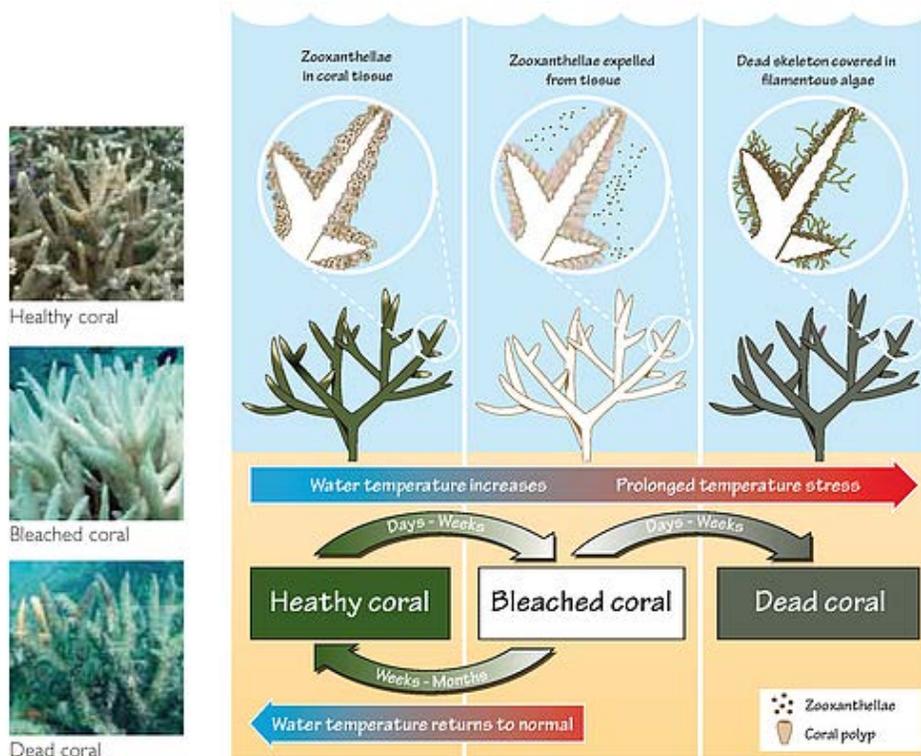


What is a coral reef

Reefs are naturally formed by corals, small animals known as polyps and belonging to the phylum of Cnidaria; other emblematic members of Cnidaria are jellyfishes.

Coral polyps can reproduce either by budding or sexually. During the mating season, corals release sperm and eggs into the water. When both sperm and eggs meet they will form a free swimming larva that will attach to a concrete substrate, generally a coral reef. Subsequently the coral will form its surrounding shell by combining carbon dioxide with calcium. They live in colonies and therefore form this accumulation of limestone known as coral reefs. An interesting fact about corals is that they host, within their tissue, a symbiotic unicellular algae known as zooxanthellae, which accounts for the reef coloration due to pigments it contains. Zooxanthellae provide their coral host with food and oxygen and in return, the zooxanthellae receive nutrients, carbon dioxide, and an enemy-free shelter. This symbiotic relationship evolved tens of millions of years ago and has been critical to the success and evolutionary radiation of corals, and to the development of reef ecosystems. Coral reefs require shallow and clear water for optimal growth and development. When the environmental conditions are not adequate (e.g. water temperature rise), the zooxanthellae will produce free radicals, triggering the coral polyp to release its symbiont; this phenomenon is known as coral bleaching because the coral animal appears to turn white after the zooxanthellae loss. Indeed, without their zooxanthellae symbionts, which contain various photosynthetic pigments, corals are nearly transparent and the white external calcium carbonate skeleton that the coral polyps live on becomes plainly visible. If the situation lasts too long it will eventually lead to the coral death as illustrated below.



Coral bleaching process as a response to water temperature rise, reproduced from "A reef manager's guide to coral bleaching", 2006.

Photo: A reef manager's guide to coral bleaching, 2006